AN EMERGENCE TRAP FOR INSECTS BREEDING IN DEAD WOOD

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The association of many insects with dead wood is well recognized. In many cases, however, details of the association are incompletely known or even quite lacking. One difficulty in studying the biology of dead wood insects is the problem of examining a piece of fallen timber without destroying what is being studied. Removing bark from a log or tearing the log apart may reveal whatever adult insects happen to be present at that time but the early stages of insects which are uncovered often cannot readily be identified and rearing them for identification can present great problems. The log, moreover, has now been destroyed.

One means of overcoming some of these problems is to keep the dead wood as it is found under as natural conditions as possible but to have it enclosed in such a way that any insects emerging are trapped. This note describes a prototype device for this purpose. Two such prototypes have been constructed and tested over a period of 12 months.

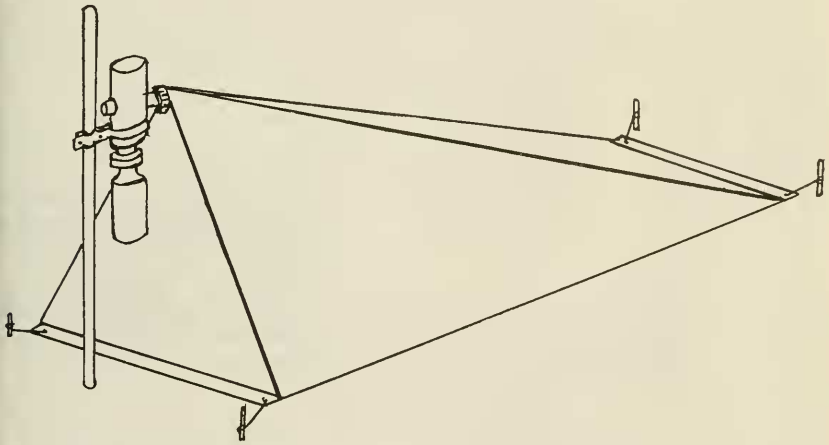

Fig. 1. The emergence trap, showing the base pegged out and the collecting head fixed to a pole and, in turn, supporting the apex of the 'tent'. For clarity, the guy ropes holding up the pole are not shown.

The device consists of a pyramidal netting 'tent' on a porous base with a collecting head fitted to the apex of the 'tent' (Fig. 1). The two prototypes are approximately 500 mm long by 900 mm high by 900 mm wide, but the dimensions of a trap to be used in a particular context will obviously depend on the amount of the dead wood being studied. The 'tent' is made from nylon netting with a mesh size appropriate to the size of the insects to be retained. The prototypes use netting supplied by Marris House Nets (54 Richmond Park Avenue, Bournemouth BH8 9DR). The four pieces which make up the 'tent' are joined appropriately together using 20 mm wide cotton tape to strengthen the seams. There is a hole at the apex of the 'tent' leading to the collecting head.

The material used in the prototypes for the base of the enclosure is closely woven polyethylene mesh such as forms the sheets ('Donkeys') used by gardeners for collecting garden debris (but see below). Similar material is used by carpet suppliers to parcel up rolls of carpeting. The lower edge of the 'tent' is sewn to the polyethylene mesh on two adjacent sides and, in use, fastened to the other two sides by means of 'Sew'n Stick' Velcro fastener. The self-adhesive strip of the Velcro is fastened to the base and the other strip is sewn to the two remaining lower edges of the 'tent'. The ends of the base are 50 mm longer than the tent to allow metal eyelets to be let into each corner. Short loops of cord are threaded through the eyelets to allow the base to be 'pegged out' and kept flat. The two prototypes have been in use for 12 months. The condition of the base after a year's exposure of the trap to the elements suggests that a more robust material will probably be necessary for long term use. The porous material 'Terram' (Imperial Chemical Industries) looks as if it may prove more suitable.

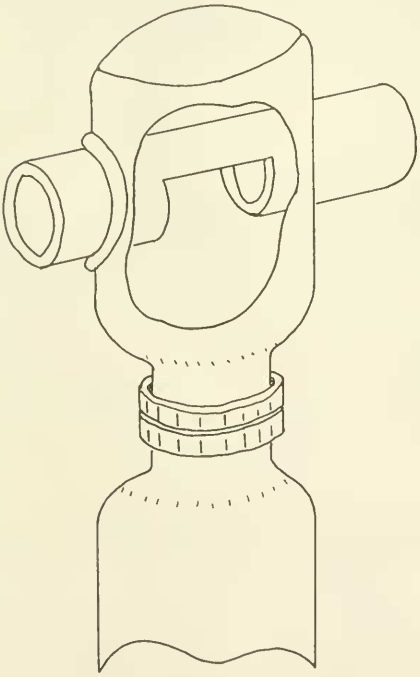

Fig. 2. The collecting head. In the figure, part of the wall of the upper container has been cut away to show the incised section of the perspex tube. The rubber bung sealing one end of the tubing and the Jubilee clip which holds the netting onto the other are not shown.

The collecting head is of the type widely used in Malaise traps. It is made from two screw-cap, wide-mouthed plastic containers (capacity 250 ml — from any camping shop) which are fastened together, one upside down above the other (Fig. 2). The two plastic caps are held together (top-to-top) by two small bolts with nuts and with plastic sealant (from a DIY shop) filling the dead space between them. A round hole (dia. 20 mm) is cut through the centre of the joined caps. When the containers are screwed onto the joined caps, they are held together and communicate via the hole in the joined caps. The upper container has a hole on each side diametrically opposite

to take a short length of clear perspex tubing (dia. 30 mm). The tubing is fixed into the container with a ring of plastic sealant against the outer wall of the container. One end of the tubing connects the apex of the net to the collecting head. The other is blocked off with a rubber bung. The connection to the 'tent' is made by sleeving the edges of the netting around the hole over the tubing and holding them in place by a 'Jubilee' clip.

Within the container, the lower wall of the perspex tubing is cut away over the centre portion (Fig. 2) so that an insect passing along the tube from the 'tent' falls into the collecting head when it reaches the cut away part of the tubing. The lower container holds an appropriate preservative, such as 50% alcohol. The collecting head is fastened to a short pole by an encircling alloy strip (Fig. 1), clamped to the pole by a nut and bolt on either side. The height at which the collecting head is fixed to the pole is adjusted to keep the 'tent' extended but not too taut. The pole is kept upright by three guy ropes.

The dead wood being studied is introduced into the trap with the free lower edges of the 'tent' held back and these edges then fastened down to the base by pressing together the Velcro strips. If the dead wood is heavy, pieces of dressed wood should be placed sideways across the base to even the pressure on it.

Obviously there are many ways in which the device described can be used to study dead wood insects. Thus the wood can have been dead and exposed to insects for a few months or for several years, before it is loaded into the trap. Alternatively, the attractiveness of dead wood to insects at different stages of decay could be examined by cutting timber live, keeping it protected from insects for a year or two and then exposing it for a period before putting it into the trap.

Choice of position for the emergence trap depends on the nature of the material being examined. A dead branch of a tree may get all the sun that shines whereas a dead branch lying on the ground in a wood with close canopy will get little or no sunshine. If material in the trap appears to be getting dry, it can be sprinkled through the net with water from a can or hose.

As an indication of the potential of this device, one trap loaded with pieces of fallen oak from Windsor Great Park in 9 months produced *inter alia* 130 beetles comprising 31 species whilst another trap loaded with Scots pine logs from the Loch Garten RSPB Reserve in 4 months produced 643 beetles comprising 12 species.

I should like to thank my wife for her usual patience and skill in constructing much of the device. Mr Ted Green procured the oak logs used in testing one prototype and Mr Stewart Taylor supplied the pine logs used in testing the other prototype and serviced the collecting head. Mr R. Locock very kindly supplied a sample of Terram.

BOOK REVIEW

The dragonflies of Europe by R. R. Askew, Colchester, Harley Books, 1988, 292 pages, 29 colour plates, £50, and **The dragonflies of Essex** by E. Benton, Essex Field Club, 1988, 138 pages, 3 colour plates, paperback, £5.95 (copies available from: M.W. Hanson, 28 Sylvan Road, London E7 8BN, p&p 55p).

Dragonflies have enjoyed a glut of books lately (see the reviews in *Proc. Trans. Br. ent. nat. Hist. Soc.* 1987; **20**: 118). This glut is both the cause and result of increased interest in the group. But for the most ancient of flying animals, it comes late; too late perhaps? The very near future will tell. Almost universally, dragonflies are associated with water in the larval stage, whether lakes, rivers, ponds or puddles, and are amongst the most vulnerable to the effects of pollution. Here are two books, both